

LeetCode
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Los Angeles, CA, USA

Abhimanyu Borthakur

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EDUCATION

- PhD ECE, UCLA** Jan 2026 – Present
- May '26: Passed the [UCLA ECE Ph.D. Preliminary Examination](#).
- MS ECE, UCLA** Sep 2024 – Dec 2025
- GPA: 3.93/4.0 (Updated: July 2025) [\[transcript\]](#)
- B.Tech ECE, Manipal Institute of Technology** [\[transcript\]](#) Jul 2018 – Aug 2022
- CGPA: 9.24/10.0 (**3.94/4.0**) (Minor in Data Science: 10.0/10.0)

AWARDS

- (Grad) 2025 Emil Wolf Outstanding Student Paper Award [\[Link\]](#)
- (Undergrad) Ranked 1st in the 7th semester (9.8/10) and awarded [Certificate of Merit](#) for top 5% finish.

MAJOR RESEARCH PUBLICATIONS AND PROJECTS

- S. Gharat, G. Bhatta, and **A. Borthakur**, *Gamma Ray AGNs: Estimating Redshifts and Blazar Classification using Neural Networks with smart initialization and self-supervised learning*, **NeurIPS 2023, ML4PS Workshop**, ([Paper #116](#)) ([Paper pdf](#)) ([Poster png](#))
- J. Hirschman, E. Abedi, M. Wang, H. Zhang, **A. Borthakur**, J. Baker, A. L. Bertozzi, R. Lemons, and S. Carbajo, *Deep learning-assisted modeling for $\chi^{(2)}$ nonlinear optics*, **Advanced Photonics**, 8(3), 036004 (2026), ([Link](#)).
- S. Carbajo, **A. Borthakur**, et al., *Structured light at the extreme: harnessing spatiotemporal control for high-field laser-matter interactions*, **Advanced Photonics**, 8(4), 044003 (2026), ([Link](#)).
- A. Borthakur**, J. Hirschman, and S. Carbajo, *Generative AI for Real-Time Ultrafast Pulse Characterization from Sparse Measurements*, **In review, Advanced Photonics Nexus**, ([preprint](#)).
- G. Bhatta, S. Gharat, **A. Borthakur**, and A. Kumar, *Gamma-ray Blazar Classification using Machine Learning with Advanced Weight Initialization and Self-Supervised Learning Techniques*, **Monthly Notices of the Royal Astronomical Society**, ([Link](#)) ([Code](#))
- S. Gharat, **A. Borthakur**, and G. Bhatta, *Estimation of redshift and associated uncertainty of Fermi/LAT extra-galactic sources with Deep Learning*, **Monthly Notices of the Royal Astronomical Society**, ([Link](#)) ([Code](#))
- S. Gharat, B. Bose, **A. Borthakur**, and R. Mazumder, *An Image Processing approach to identify solar plages observed at 393.37 nm by the Kodaikanal Solar Observatory*, **Royal Astronomical Society Techniques and Instruments**, ([Link](#)) ([Code](#))

RESEARCH EXPERIENCE

Quantum Light-Matter Co-Operative (QLMC) @ UCLA ([Website](#))

Oct 2024 – Present

Start-to-End (S2E) Modeling Framework for a high-powered laser system

Advisor: Prof. Sergio Carbajo, UCLA

- Led the development of a high-fidelity digital twin for a high-powered laser system, integrating complex nonlinear optical phenomena like CPA [\[ref\]](#).
- Built a synthetic data pipeline generating 1M+ spectrogram–pulse pairs to train and evaluate large ML models across diverse optical simulation settings.
- Achieved 10× improvement in pulse retrieval from sparse FROG spectrograms using diffusion models, outperforming state-of-the-art (SOTA) CNN and RNN baselines [\[ref\]](#).
- Built an autoregressive Transformer for simulator-in-the-loop inverse design of laser systems; derived theoretical bounds relating local node errors to final design error.
- Modeled laser systems as graph-structured node chains and explored agentic beam/lookahead search with an optional LLM controller for adaptive branching.

University of Zielona Góra & IIT Bombay

Sep 2022 – Jan 2024

Gamma Ray AGNs: Estimating Redshifts and Blazar Classification using Neural Networks with smart initialization and self-supervised learning

Advisor: Prof. Gopal Bhatta, University of Zielona Góra, Poland

- Developed a neural network to predict redshifts of active galactic nuclei – with a correlation of 0.78, outperforming previous SOTA models [\[ref\]](#).
- Modeled uncertainty using variational inference, enabling reliable redshift predictions even for sources lacking ground truth labels.
- Designed and deployed an algorithm to classify supermassive blackhole systems on [AWS EC2](#), achieving 93% accuracy and 0.914 F1-score, 7× faster than previous SOTA [\[ref\]](#).

WORK EXPERIENCE

Searce Inc @ Pune, Maharashtra, India

Jan 2022 – Sep 2022

Machine Learning Engineer

Manager: Dr. Muthukumaraswamy B, Associate Director - Applied AI

- Earned the [Google Cloud Professional ML Engineer Certificate](#) within 6 months – an exam recommended for professionals with 3+ years of industry experience.
- Architected a custom OCR system to extract fields from Indian tax forms, achieving 92.1% mean average precision on test data with an average (CPU) processing time of 3.4 seconds.
- Co-led the database design pipeline for a US-based client project, deployed at scale on GCP BigQuery.

SKILLS

- **Programming:** Python, MATLAB, C/C++, SQL
- **ML & Scientific Computing:** PyTorch, TensorFlow, Scikit-Learn, NumPy, SciPy, Pandas
- **Computer Vision:** OpenCV
- **Cloud & MLOps:** GCP, AWS, Docker, Kubernetes, Weights & Biases, MLflow
- **Developer / Research Tools:** Git, Jupyter, $\text{\LaTeX}$, LabVIEW
- **Projects:** [Portfolio](#)